

REMARKS

Entry of the foregoing and reexamination and reconsideration of the subject application, as amended, pursuant to and consistent with 37 C.F.R. § 1.112, are respectfully requested in light of the remarks which follow.

Claims 1-29 and 31-35 are pending. Claims 22-29 and 32-35 are allowed.

Claims 1-35 are amended herein, and new claims 36-43 are added. Independent claims 1 and 22 are amended to recite that there may be two separate elements (*e.g.*, a first electrolyte element related with the first gate electrode and a second electrolyte element related with the second rate electrode), that the gate electrodes are separated from the electrochemically active element should be specified in the definition of the gate electrodes, and that the organic material has the ability of electrically altering its conductivity. New claims 36-39 and 40-43 have been added to further elucidate claims 1 and 22 respectively. Claims 2-21 and 23-25 are amended herein to appear in proper U.S. format and to bring the claims in line with amended claims 1 and 22.

Basis for the amendments to the claims and new claims 36-43 may be found throughout the specification and claims as-filed, especially at page 11, line 4, pages 17-18, claim 9 and Figures 3A and 3B. No new matter is submitted by way of the present Amendment. Applicants reserve the right to file a divisional or continuation application directed to any subject matter canceled by way of the Amendment.

Claim Objections

Claim 9 is objected to for the recitation of "the device comprising". Claim 9 is amended herein to recite "and the electrochemical transistor device further comprises". Thus, this objection is obviated.

Claim Rejections Under 35 U.S.C. § 112

Claim 12 stands rejected under 35 U.S.C. 112, second paragraph, as purportedly indefinite. The Office Action states that the term "optionally substituted" is not clear. Applicants submit that this term is well known in the art. Specifically, the skilled artisan would recognize this term to mean that oxy-alkylene-oxy bridge may be substituted with any appropriate substituent.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-3, 7, 8, 10, 11 and 16 stand rejected under 35 U.S.C. 102(e) as purportedly anticipated by Madden *et al.*

"[A]nticipation requires the presence in a single prior art disclosure of all elements of a claimed invention as arranged in the claims." *Jamesbury Corp. v. Litton Industrial Products, Inc.* 225 U.S.P.Q. 253, 256 (Fed. Cir. 1985). Poulouse *et al.* do not describe or suggest all of the elements of the rejected claims as amended herein, as discussed in greater detail below.

Madden *et al.* is cited for purportedly disclosing a supported or self-supporting electrochemical transistor device comprising a source contact, a drain contact, at least one gate electrode, an electrochemically active element (conducting polymer) arranged between and in direct electrical contact with the source and drain contacts, wherein electrochemically active element comprises a transistor channel and is of a material comprising an organic material having the ability of electrochemically altering its conductivity through change of redox state thereof, and a solidified electrolyte in direct electrical contact with the electrochemically active element and the at least one gate electrode and interposed between them in such a way that the electron flow between the electrochemically active element and the at least one gate electrode is prevented and the flow of electrons between source contact and drain contact is controllable by means of a voltage applied to the at least one gate electrode.

Claims 1-3, 7-8, 10-11 and 16 (as well as independent claim 22 and dependent claims) have been amended to recite electrochemical transistors that use two gate electrodes. Madden *et al.* fail to recite the element of the presently claimed invention directed to electrochemical transistors utilizing two gate electrodes.

Furthermore, the claims as amended recite a redox sink volume in the transistor device. Madden *et al.* fail to recite the use of a redox sink volume in the transistor device. The claims as amended herein further recite the use of two separate electrolyte elements. Madden *et al.* fail to recite this element of the present claims.

As Madden *et al.* fail to recite all of the elements of the presently claimed invention, as amended herein, Applicants respectfully request that this rejection be withdrawn.

Claim Rejections Under 35 U.S.C. § 103

Claims 12-15 stand rejected under 35 U.S.C. 103(a) as purportedly being unpatentable over Madden *et al.*, in view Cloots *et al.*

The Office Action states that the electrochemical transistor device disclosed by Madden *et al.* includes all the limitations claimed except that the electrochemical transistor device is self-supporting. However, the Office Action states that it would have been obvious to one of ordinary skill in the art at the time the invention was made that the transistor device disclosed by Madden *et al.* is self-supporting because it is purportedly well known that solid materials are self-supporting.

Claim 19 stands rejected under 35 U.S.C. § 103(a) as purportedly unpatentable over Madden *et al.* The electrochemical transistor device disclosed by Madden *et al.* purportedly includes all the limitations claimed except that the electrochemical transistor device is self-supporting. The Office Action states that it purportedly would have been obvious to the skilled artisan that the transistor device disclosed by Madden *et al.* is self-supporting because it is well known that solid materials are self-supporting.

Claims 20 and 21 stand rejected under 35 U.S.C. 103(a) as purportedly being unpatentable over Madden *et al.*, in view of Duthaler *et al.* The Office Action states that it would have been obvious to one of ordinary skill in the art at the time the invention was

made to modify the device of Madden *et al.* to arrange the transistor device on a support as disclosed by Duthaler *et al.* in order to increase production.

Applicants respectfully traverse.

As set forth in M.P.E.P § 2142, in order to establish a *prima facie* case of obviousness, three criteria must be met, *i.e.*, (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, (2) there must be a reasonable expectation of success, and (3) the prior art references must teach or suggest all the claim limitations. Applicants submit that these criteria have not been met by the cited references.

As amended herein, claims 12-15, 19 and 20-21 (as dependent on amended claim 1), as well as the other pending and new claims recite that the electrochemical transistors use two gate electrodes. The use of two gate electrodes allows for a new and unexpected way of addressing electrochemical transistors. Specifically, the electrochemically active element can be addressed without direct electrical contact between the electrochemically active element and the gate electrodes. A benefit of this improvement is that the gate electrodes (and thus the gate voltage) may be applied at a distance, without electrical contact with the electrochemically active element. Instead, the electrochemically active element is addressed by an ionic current via the electrolyte, and the ionic current induces an electronic current in the electrochemically active element. The primary reference, Madden *et al.* do not disclose or even suggest that the electrochemical transistors use two gate electrodes.

There is no teaching in the primary reference to motivate the skilled artisan to use two gate electrodes with the electrochemical transistors, or to provide the skilled artisan with any expectation of success.

The claims as amended herein further recite the use of two separate electrolyte elements. An advantage of this design is that embodiments employing a redox sink volume can be made bi-stable, because the redox sink volume and the transistor channel only have electronic contact but not ionic contact (both of which are necessary for balancing out the opposing redox states in the transistor channel and the redox sink volume, respectively).

The respective secondary references, Cloots *et al.* and Duthaler *et al.* fail to remedy the deficiencies of the primary reference, as they also fail to disclose or suggest the elements of the claimed invention, as amended herein.

Thus, Applicants respectfully request that these rejections be withdrawn.

C O N C L U S I O N

In view of the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order. Such action is earnestly solicited.

In the event that there are any questions relating to this application, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that prosecution of this application may be expedited.

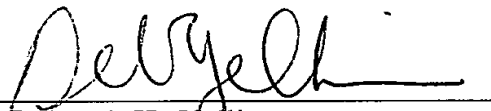
In the event any further fees are due to maintain pendency of this application, the Examiner is authorized to charge such fees to Deposit Account No. 02-4800.

Respectfully submitted,

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By: _____


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